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# CURRENT LITERATURE

## BOOK REVIEWS

### Fungous diseases of plants

Owing to the existence of an extensive system of experiment stations in the United States, one of whose chief activities has been the investigation of plant diseases, the conditions for the accumulation of facts relating to plant pathology have been unusually favorable. Following the progress made in investigation, the teaching of plant pathology has begun to develop chiefly in the agricultural colleges associated with the stations. Thus far, however, there has been no attempt to organize into a comprehensive text the vast material accumulated by plant pathologists and to make it available for teachers, although a need for such work has been felt by those who have attempted to teach the subject. The appearance of DUGGAR's book<sup>1</sup> on plant diseases is therefore both timely and desirable. The work, as the preface indicates, is designed primarily as a textbook, but its possible service as a reference book has also been kept in view. Aside from the brief historical introduction, it falls into three parts: (1) culture methods and technic, (2) physiological relations, and (3) fungous diseases of plants.

The first part is designed to introduce the student to the methods and manipulations used in the study of fungous diseases. In it are treated the methods of handling apparatus, the preparation of culture media, the cultivation of organisms, and microscopical technic. On the whole, the directions are clear and to the point, and embody many details of manipulation which are acquired only through intimate experience with such work. The use of the freezing method for cutting sections should perhaps have been mentioned, especially as its adaptability for certain kinds of work has been recently emphasized.<sup>2</sup>

The part on physiological relations comprises a discussion of the germination of spores and the modes of life and relation to environmental factors of parasitic fungi, together with chapters on artificial infection, disease control, and the preparation of fungicides. It stands for the whole field which belongs peculiarly to the general subject of plant pathology. Considered from this standpoint, the treatment is surprisingly brief and much that is in the chapter does not belong there. This is especially true of that part of the chapter on germination which deals with methods, part of the section on environmental factors, and nearly all of the chapter on artificial infection. These should have been included in the

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<sup>1</sup> DUGGAR, B. M., *Fungous diseases of plants*. 8vo. pp. xii + 508. *figs.* 240. Boston: Ginn & Co. (undated).

<sup>2</sup> FREEMAN, E. M., The ether freezing microtome in botanical work. *Science* N.S. 25:747-749. 1907.

first part on methods and technic. The field represented by this part has been so greatly enriched in recent times, by the addition of both facts and ideas, that the treatment seems wholly inadequate.

The last part, making up the bulk of the work, deals individually with the plant diseases induced by fungi, under which the author includes the myxomycetes and bacteria. The arrangement is in the order of taxonomic sequence, each chapter representing one of the large divisions of the fungi, as Phycomycetes, Ascomycetes, etc. The individual diseases are treated in numbered sections of the chapters. A section is given to the discussion of each disease, except those of minor importance, which are grouped together. The arrangement serves to bring out the morphological relations of the disease-producing fungi, without laying too much stress on purely morphological and taxonomic features. Some clearness would have been gained if the discussion of orders and families had not been forced into the system under headings coordinate with those under which the individual diseases are discussed. The treatment of the diseases is clear and comprehensive, each being discussed with reference to its distribution, the influence of environmental factors on its occurrence and prevalence, the life history of its causal organism, and the methods of its control. In the relative prominence given to the various diseases, the author has been guided by their economic importance, but the scope has been made broad enough to include all of the common diseases injurious to cultivated crops. A few diseases not occurring in this country have been included, apparently for the sake of completeness. As a rule, the text is conservative and free from innovations at variance with current usage. There is one notable exception, however, in the introduction of a series of newly compounded terms to apply to certain artificial groups of the rusts, based on the number of spore-forms present in the cycle. Thus we have "euautouredo" to include all autoecious rusts possessing all spore-forms, and "opsiautouredo" to include all autoecious rusts lacking the uredo stage, etc. Aside from any criticism that may be offered on account of the faulty composition of these unwieldy terms, the pedagogical soundness of introducing them for the first time through the medium of a textbook may well be questioned.

In matters of detail, the work shows an unusual lack of care in the preparation of the manuscript or in proofreading. The following examples serve as illustrations: on page 54 "Löwitz" is printed for "Löwit"; on page 86 "Scot" for "Scott"; and on page 121, second citation, "Histology" for "History." In the legend of fig. 50 a germinating oospore is described as a "germinating oogonium." On pages 272 and 276 "VON SCHRENK" should read "VON SCHRENK and SPAULDING." On page 337 the citation of MCALPINE should read "Stone-fruit trees" instead of "Stone fruits." *Phoma Betae* is said not to occur in the United States (p. 344), but it has been reported from Colorado and Kansas.<sup>3</sup> On page 386, note, ARTHUR is said to have introduced the terms "*pycnium*, *aecium*,

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<sup>3</sup> ORTON, W. A., Plant diseases in 1907. Yearbook Dept. Agr. 1907:577-589; see also Yearbook 1906:502 (*Phyllosticta Betae* Oud.).

*uredinium*, and *telium* in substitution for teleuto, uredo, aecidial, and spermatogonial stages" of the rusts, instead of the reverse order. On page 467 *Trametes Pini* is said to be the "chief cause of loss among fungi."

On the whole, the book is an excellent presentation of the subject of plant pathology from an American standpoint. Most of its shortcomings relate to individual or minor details. In it the vast amount of material collected through the agencies of the experiment stations and the U.S. Department of Agriculture has been brought together for the first time in an easily available form. The facts presented are largely derived from American work and apply to American conditions. It is sufficiently comprehensive for a textbook, and will be of much service as a reference book in the field which it represents. The style is clear and concise, and the arrangement is that which the teacher would naturally adopt. The free citation of literature is of great service to both student and teacher. The book is abundantly illustrated, and both illustrations and press work are all that could be desired.—H. HASSELBRING.

### The morphology of plants

The third and last volume of VELENOVSKÝ's textbook<sup>4</sup> on the comparative morphology of plants deals with the flower of phanerogams, the ovule, pollination, embryo, seed, fruit, and the evolution of plants. Fertilization, parthenogenesis, and polyembryony are treated under the section on the ovule, preceding the description of pollination. The volume opens with the following definition of a flower: "The flower of phanerogams is a shortened axis of limited growth, which carries foliar organs adapted to the purposes of fertilization." We are assured that this definition applies to all cases except the female structures of the genus *Cycas*, which are not regarded as flowers.

The book deals almost entirely with the grosser external features of plants, little attention being given to the details of development. It must be confessed that the phase of morphology represented by this book is somewhat neglected by modern morphologists, who are likely to pay insufficient attention to the taxonomic side of botany. Morphologists should find the work useful as a reference and as a supplement to their taxonomy; but as a complete textbook of morphology it is not comprehensive enough to meet modern demands.—CHARLES J. CHAMBERLAIN.

### NOTES FOR STUDENTS

**The cretaceous plants of Japan.**<sup>5</sup>—This interesting product of the Anglo-Japanese understanding represents the structural study of partly calcified and partly silicified nodules from the Upper Cretaceous of Hokkaido in northern

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<sup>4</sup> VELENOVSKÝ, JOS., Vergleichende Morphologie der Pflanzen. Vol. III. pp. 478. pls. 6-9. figs. 400. Prag: Fr. Řivnáč. 1910. For review of vols. I and II see BOT. GAZETTE 44:310. 1907.

<sup>5</sup> STOPES, MARIE C., and FUJII, K., Studies on the structure and affinities of cretaceous plants. Phil. Trans. Roy. Soc. London B 201:1-90. pls. 1-9. 1910.